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PHOTOMETRIC AND POLARIMETRIC OBSERVATIONS OF THE POST-AGB STAR SAO 124414

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Post-AGB stars are suspected to be in an intermediate evolutionary state between asymptotic giant branch and planetary nebula stages. Together with the study of long period variables (Mira Ceti type stars) we have performed a photometric and polarimetric monitoring of 4 post-AGB stars, from March to July 1997. In this paper, we present the preliminary results of these observations for one of these objects: SAO 124414.

The observations have been carried out with the photopolarimeter attached to the 50cm AZT-14 telescope of Byurakan observatory. Detailed description of the observational method and instruments has already been published (Eritsian, Nersisian, 1984 and Magnan et al., 1996). The observations have been done in B, V, R bands. The uncertainties in the photometric and polarimetric measurements are σ=0.01–0.02 mag and σ_P=0.1–0.2%, respectively. The uncertainty in the determination of the polarization angle is $\sigma(\theta)$=1–2°.

During the observational period, no significant light variation was detected. In Table 1 we present the results of photometric and polarimetric observations for the star SAO 124414. We display the Heliocentric Julian dates of observations (column 1), the B, V and R magnitudes (columns 2 to 4), the degree of polarization in B, V and R bands (columns 5 to 7) and the polarization angle (columns 8 to 10).

As one can see from the data listed in Table 1, while the brightness of the star is constant during the observational period, a significant time variation of polarization is detected. The absence of polarization of nearby background stars that we have also observed, the time variation and the wavelength dependence of linear polarization of SAO 124414 indicate that this detected polarization has an intrinsic character, as already mentioned in Trammell et al. (1994). This confirms that the star SAO 124414 has an extended circumstellar envelope (see for instance Hawkins et al, 1995). The varying polarized light that we have detected for SAO 124414 may be the result of inhomogeneities and/or unstable morphology of the nebula.

Table 1: Photometric and polarimetric measurements for SAO 124414

Julian date	B	V	R	P%(B)	P%(V)	P%(R)	θ(B)	θ(V)	θ(R)
2450603.33	9.58	8.61	8.42	3.0	2.0	1.8	124°	132°	127°
2450603.39	9.58	8.61	8.42	3.0	2.0	1.8	124	132	127
2450604.27	9.58	8.60	8.41	3.0	2.0	1.7	125	130	127
2450613.23	9.62	8.61	8.40	3.5	2.0	2.0	129	129	126
2450613.27	9.61	8.61	8.40	3.5	2.0	2.0	129	129	126
2450613.32	9.60	8.59	8.42	3.5	2.0	2.0	128	127	126
2450613.36	9.60	8.60	8.41	3.5	2.0	2.0	129	128	126
2450613.42	9.62	8.61	8.40	3.5	2.0	2.0	129	128	127
2450637.29	9.59	8.60	8.40	2.7	2.1	1.6	138	129	128
2450638.31	9.59	8.61	8.41	2.8	2.2	1.5	124	148	138
2450640.30	9.60	8.62	8.40	2.1	1.6	0.8	140	135	135
2450640.38	9.61	8.60	8.40	2.1	1.6	0.8	139	135	133
2450640.50	9.60	8.61	8.40	2.2	1.6	0.8	140	135	135
2450641.25	9.58	8.59	8.42	3.7	3.1	1.3	143	138	129
2450641.39	9.58	8.59	8.40	3.7	3.1	1.3	142	137	126
2450641.47	9.58	8.60	8.40	3.7	3.1	1.3	142	137	127

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